

## SECTION 32 9113 - SOIL PREPARATION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Furnish labor, material and equipment required for placement and amendment of topsoil for areas to be planted, and the establishment of finish grades as shown on the Drawings and as specified herein.
- B. Coordinate work with installation of other site work including earthwork, irrigation, seeding..

## 1.2 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of amended topsoil soil.
- B. Amended Topsoil: Native or imported topsoil or surface soil modified with soil amendments and fertilizers.
- C. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.
- D. Soil Ripping: Loosening the soil by dragging a ripping shank or chisel thru the soil to the depths and spacing specified, and further defined in this specification.
- E. Soil Tilling: Loosening the surface of the soil to the depths specified with a rotary tine tilling machine, roto tiller, (or spade tiller), and further defined in this specification.

## 1.3 SUBMITTALS

- A. Product Data. Include Material Safety Data Sheets (MSDS) where applicable: For the following:
  - 1. Fertilizers, including application rates.
  - 2. Soil Amendments.
  - 3. Herbicides.
- B. Product Certificates: For each type of manufactured product, signed by product manufacturer, and complying with the following:
  - 1. Manufacturer's certified analysis for standard products.
  - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- C. Qualification Data: For testing agencies.

- D. Delivery Slips: Provide delivery slips for each load of delivered material as proof of shipment of specified materials.
- E. Soil Placement Map: Contractor shall provide a plan showing placed location of each load of delivered soil, referenced to delivery slips.

#### 1.4 QUALITY ASSURANCE

- A. Soil Fertility and Agricultural Suitability-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
  - 1. Acceptable Soil Testing Laboratories are:
    - a. A & L Western Agricultural Laboratories, (503) 968-9225.
    - b. Western Laboratories, Inc, (800) 658-3858.
    - c. Soil and Plant Laboratory, Inc., (503) 557-4959.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver packaged materials in manufacturer's unopened containers fully identified by name, brand, type, weight and analysis.
- B. Store and handle packaged materials to prevent damage and intrusion of foreign matter.
- C. Store stockpiled topsoil in area designated by Owner's Representative. Provide erosion control measures for stockpiled topsoil on site to prevent contamination of the soil. Refer to Division 31 Section "Earth Moving" for control of dust and erosion.

#### 1.6 SITE CONDITIONS

- A. Topsoil placement and soil preparation shall not take place during periods where saturated soil or surface water is present in work areas.
- B. Work shall not take place when temperature is less than 32 degrees Fahrenheit, or when frozen soil exists on site.

#### 1.7 COORDINATION

- A. Coordinate soil preparation with Division 31 Section "Earth Moving" such that topsoil, soil amendments and fertilizers are incorporated into ground fill areas in specified lifts and to specified depths below finish grade for planting and lawn areas. Topsoils shall be amended per recommendations of the Soils Testing Laboratory.
- B. Coordinate soil preparation with timing and procedures for installation of related site work including irrigation, seeding, and planting.

## PART 2 - PRODUCTS

## 2.1 FERTILIZER

- A. Fertilizer composition and rate to be determined based upon soil analysis. For bidding purposes, assume: 10 Nitrogen (N), 10 Phosphorus (P), 10 Potassium (K), 5 Sulfur (S) applied at a rate of 10 pounds per 1000 square feet in all planting beds and seeded areas.
- B. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of **[1]** **[4]** percent nitrogen and **[10]** **[20]** percent phosphoric acid.
- C. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- D. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- E. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium derived from natural organic and inorganic sources in the following composition:
  - 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

## 2.2 MISCELLANEOUS PRODUCTS

- A. Post-Emergent Herbicide: Select one of the following: "Glyphogan Plus" by Mana, "Envoy Plus" by Valent, "Crossbow" by Dow AgroSciences, "Landmaster BW" by Agri Star or approved equal. Beaverton School District is to review and approve all herbicides prior to application.
- B. Pre-Emergent Herbicide: "Ronstar-G" by Bayer, "Dimension EC," by Dow AgroSciences or equal. Products containing either pendimethalin or DCPA are prohibited.
- C. Contact Herbicide for controlling nutsedges: "SedgeHammer" by Gowan.

## PART 3 - EXECUTION

## 3.1 EXAMINATION OF SITE CONDITIONS

- A. Examine for site conditions that will adversely affect execution, permanence, quality of work, and survival of plant material and grasses.

- B. Identify areas to receive planting and lawn on site.
- C. Verify that subgrades and slopes of lawn and planting areas are acceptable to Owner's Representative prior to commencing work of this Section.
- D. Should the Contractor find any discrepancies between the Drawings and the physical conditions, inform the Owner's Representative immediately for clarification.
- E. Begin Work required under this Section only after conditions are satisfactory.

### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, and existing lawns and exterior plants from damage caused by soil preparation operations.
- B. Prepare soils at a time when moisture conditions will permit proper cultivation.
- C. Remove stones over 1-inch diameter, sticks, roots, mortar, concrete, rubbish, debris, and all materials harmful to plant life, and legally dispose of them off Owner's property.
- D. Remove or spray as required to eradicate noxious weed growth and roots.
  - 1. Achieve complete removal or kill of all weeds within all areas receiving new plantings and lawn areas.
  - 2. Apply post-emergent herbicide over all areas of weed or grass growth within landscaped area to eradicate weed growth and roots. Apply in two applications at manufacturer's maximum recommended rate, as follows:
    - a. First application: Apply 7 days prior to performing soil preparation.
    - b. Second application (to kill new vegetation): Apply after soil preparation has been completed and minimum of 48 hours prior to planting.
    - c. Observe manufacturer's recommended period prior to working in treated areas.
  - 3. Apply contact herbicide directly onto foliage of nutsedges. In areas of established lawn grasses infested with nutsedge, apply herbicide by wicking. Do not spray.
- E. Locate and securely mark or flag irrigation sprinkler heads, area drains, catch basins, clean outs, manholes, valve boxes, and other site improvements not extending above finish grade.
- F. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, in accordance with City of Beaverton and Beaverton School District requirements.

### 3.3 SOIL PREPARATION FOR SEEDED LAWNS

- A. This article pertains to new lawns and grasses as shown on Drawings and existing lawn and grass areas disturbed by construction activities.

- B. Lawn area subgrade preparation:
  - 1. See sheet notes on L300 & L400.
- C. Leveling Rolling: Drag with flexible tine harrow (or approved equipment) to remove ridges and fill depressions, as required to meet finish grades. Roll areas (minimum roller weight 10 pounds per square inch) in two opposing directions.
- D. Repeat rolling procedures and drag lightly to establish a smooth uniform compacted surface free of rocks and other extraneous matter. Provide compaction to 80 **[85]** percent relative density or as indicated in Division 31 Section "Earth Moving."
- E. Water lightly and allow planting mix to settle. Add additional material at mixture indicated in paragraph above to bring soil level to grades shown on the Drawings with allowance at pavement edges. Provide compaction to 80 percent relative density
- F. Meet lines, grades and elevations shown, after light rolling and natural settlement. Fine grade lawn areas to smooth even surface with loose, uniformly fine texture. Rake and drag lawn areas removing ridges and filling depressions to obtain firm finished grades for receipt of lawn planting.
- G. Remove stones over 1/2-inch in any dimension and sticks, roots, rubbish and other extraneous matter.
- H. Finish Grading: Grade lawn areas to smooth, even surface with a loose uniformly fine texture. Finish grade of soil shall be 1/2 inch below adjacent pavement. Limit preparation to areas which will be planted promptly after preparation.
- I. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- J. Prior to commencing seeding operations restore seed beds to their finish grade condition if eroded, hardened or glazed or disturbed in any other manner following completion of finish grading. Restoration of seed bed areas shall be considered incidental to the project Work and performed at no additional cost to the Owner.

#### 3.4 FINE GRADING

- A. Finish grade after full settlement including mulch, shall be 1 inch below tops of curbs, walks, or existing grades in shrub areas and 3/4 inch lower in lawn areas.
- B. Slope all areas to prevent puddling and drain surface water toward catch basins, drains, curbs, or off-site as shown on Drawings.
- C. Soil in all areas shall be thoroughly settled, with a smooth surface free of humps and hollows, and shall be firm enough to resist undesirable impressions when stepped upon.
- D. Use levels, screens, drags, or any other equipment necessary to establish and verify grades and surfaces.

- E. Finish grade lawn, grass and planting areas to smooth, even surface with loose, uniformly fine texture.
- F. Roll, rake, and drag lawn areas, remove ridges and fill depressions with amended topsoil to obtain firmness and finish grades as indicated.
- G. Notify Owner's Representative 36 hours in advance to review fine grading of lawn, grass and planting areas. Finish grades shall be prepared to the satisfaction of the Owner's Representative prior to planting.

### 3.5 CLEAN-UP

- A. Clean up excess materials and debris from project site upon completion of work or sooner if directed by the Owner's Representative.
- B. Leave in neat and tidy condition daily.

### 3.6 DISPOSAL

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 32 9113

## SECTION 32 9200 - LAWN AND GRASSES

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Seeding.
2. Herbicides.

#### 1.2 GENERAL REQUIREMENTS

- A. Comply with governing regulations applicable to landscape materials.
- B. Do not make substitutions. If specified landscape material is not obtainable, submit to the Owner's Representative proof of non-availability and material proposed for use as equivalent material.
- C. Proceed with and complete the landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Submit the following within 30 days from Award of Contract:
1. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
  2. Vendor's proof of order for each seed mix specified. Deliver the seed bag tags to Owner's Representative.
  3. Fertilizers: Submit manufacturer's guaranteed analysis.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn, and sports field turf establishment.
1. Installer's Field Supervision: Installer shall maintain an experienced full-time supervisor on the Project site when planting is in progress.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

### 1.6 PROJECT CONDITIONS

- A. Coordinate work with installation of other site work including irrigation and planting.
- B. Verify soil preparation has been completed. Identify conditions not indicated on the Drawings and those which will adversely affect the execution this work. Notify the Owner's Representative of unsatisfactory conditions immediately.
- C. The Contractor shall utilize temporary irrigation or other means and methods as approved by the Owner's Representative, to achieve the Satisfactory Establishment and Warranty requirements as identified within this specification.
- D. The Owner's Representative shall determine areas beyond those indicated on the Drawings which require preparation and seeding due to construction disturbance. This work shall be performed by the Contractor at no additional cost to the Owner.
- E. Notify the Owner's Representative of conditions unfavorable to the propagation and growth of lawn such as; rubble, construction debris, rock fill, glazed soil, hardened soil or adverse drainage conditions before commencing planting or adding soil amendments. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Owner's Representative.
- F. Environmental Requirements: Do not place, spread, or roll fill materials during unfavorable weather conditions. When work is interrupted by adverse weather conditions, do not resume fill operations until moisture content and density of fill are satisfactory.
- G. Protection of subgrade: Do not allow equipment to pump or rut subgrade, stripped areas, footing excavations or other areas prepared for the Project. Protect subgrades, fills and excavation areas from surface waters flowing into the work areas.
- H. Continuity of Soil Preparation and Seed Application: Prepared soil conditions shall not be allowed to lie fallow. Seeding operations shall commence within 72 hours of approval of finish grading. Should precipitation in excess of 0.25-inches occur within this time period, the soil surface shall be examined upon drying, areas greater than 6-inches in any dimension which are smooth or glazed in appearance shall be re-cultivated. If glazing is evident in multiple portions of the seedbed, the entire bed shall be re-cultivated to establish a friable soil surface. If for any reason, seeding does not occur within the designated 72 hours, the soil shall be re-cultivated and raked prior to seeding to achieve a finish grade condition as identified within the "Soil Preparation" specifications. Any and all re-raking and supplemental cultivation procedures shall be considered incidental to the project Work and performed at no additional cost to the Owner.
  - 1. Season: Seeding shall take place between April 1st and September 15<sup>th</sup>, and be performed during normal weather and temperatures appropriate and typical for such work. Non-irrigated areas shall be seeded between April 1st and April 15 or between September 15 and October 1.



2. Seeding on other dates or during adverse conditions is at the risk of the Contractor and will require additional site inspections to determine seed establishment, areas of seed re-application and the extension of the maintenance and warranty periods as determined by the Owner's Representative. All required inspections, labor & materials to execute this work shall be at the Contractor's expense and performed in accordance with the requirements of this specification section.

#### 1.7 PROTECTION

- A. Provide adequate measures to protect workers and passers-by the site. Execute all work in an orderly and careful manner with due consideration for any and all surrounding areas, plantings, or structures which are to remain. Protect all adjacent property and improvements from work damage, and replace any portions damaged.
- B. Any structures or facilities damaged due to Work of this Section shall be restored equal to or better than their original condition at the Contractor's expense and to the satisfaction of the Owner's Representative, at no additional cost to the Owner.

### PART 2 - PRODUCTS

#### 2.1 SEED

- A. General: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America.
- B. Grass Seed Mix: Subject to compliance with requirements, provide the following proprietary seed mixes:
  1. Out Field Seed: Wilbur-Ellis Co. "Fairway Supreme" Willsonville, Oregon (503) 964-7659. Application rate: **10** pounds per 1000 square feet
  2. Or approved equal to a 3-way mix of: 33% Pavillion Perennial Ryegrass, 33% Fiesta 4 Perennial Ryegrass, 33% Banfield Perennial Ryegrass.

#### 2.2 TOPSOIL

- A. Topsoil: See Division 32 Section "Soil Preparation."

#### 2.3 INORGANIC SOIL AMENDMENTS

- A. Inorganic Soil Amendments: See Division 32 Section "Soil Preparation."

#### 2.4 ORGANIC SOIL AMENDMENTS

- A. See Division 32 Section "Soil Preparation."

2.5 TOP DRESSING

- A. Top dressing for hand seeding small areas where machine seeding is not feasible (not needed with seeding machine).
  - 1. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed peat moss, having a water-absorbing capacity of 1100 to 2000 percent.
  - 2. Compost: See Division 32 Section "Soil Preparation."

2.6 HERBICIDES

- A. Post-Emergent Herbicides: EPA registered and approved, of type recommended by manufacturer for selective weed eradication. "Glyphogan Plus Round-Up" by Mana, "Envoy Plus" by Valent, "Crossbow" by Dow AgroSciences, "Landmaster BW" by Agri Star or approved equal.
- B. Pre-Emergent Herbicides: EPA registered and approved, of type recommended by manufacturer for selective weed prevention. "Ronstar-G" by Bayer, "Dimension EC" by Dow AgroScience, or equal. Products containing either pendimethalin or DCPA are prohibited.

2.7 FERTILIZER

- A. Meet requirements of applicable State fertilizer laws. Fertilizers shall be uniform in composition, dry and free flowing. Deliver to the site in original unopened containers each bearing manufacturer's guaranteed analysis.
- B. Composition and rate of fertilizer used to amend topsoil is to be determined by soil analyses. Refer to Division 32 Section "Soil Preparation" for soil fertility testing requirements.
- C. Commercial Fertilizer: Slow release, granular fertilizer that is derived from natural organic and inorganic sources.
  - 1. Starter Fertilizer: Woodburn Fertilizer 'Perfection Mix #29' 15-15-15 w/Minors, as available from Woodburn Fertilizer, Woodburn; Oregon; Tel.: 1-503 981 3521, or equal
  - 2. Maintenance Fertilizer: Woodburn Fertilizer 'Regal Green' 21-4-21 with 50 percent of the nitrogen controlled release from superior Duration™ Type II, as available from Woodburn Fertilizer, Woodburn, Oregon; Tel.: 1-503 981 3521, or equal.

2.8 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

- B. Peat Mulch: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed peat moss, having a water-absorbing capacity of 1100 to 2000 percent.
- C. Compost Mulch: See Division 32 Section "Soil Preparation."
- D. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 2.8 to 6.8.
  - 1. Non-Irrigated Lawns and Grasses: Interlocking crimped polyester fibers combined with wood fibers and cross-linked tackifier, Profile Products, LLC "Conwed Fibers Flexterra HP-FGM" or equal.
- E. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application with seed, mulch and fertilizer; nontoxic and free of plant-growth or germination inhibitors.

## 2.9 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with specification requirements and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Confirm irrigation coverage test has been performed, all irrigation trenches have been backfilled and compacted and soil preparation has been performed in accordance with procedures outlined in the Soil Preparation specification.

## 2.10 PREPARATION

- A. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

## 2.11 LAWN AREA PREPARATION

- A. See Division 32 Section "Soil Preparation."

## 2.12 HERBICIDE APPLICATION

- A. Spray herbicides as required to eradicate[and prevent emergence of] noxious weed growth.
  - 1. Apply] herbicides over all areas of weed or grass growth within landscaped area to eradicate weed growth. Apply in single application at manufacturer's maximum recommended rate, as follows:

- a. Apply after soil preparation has been completed and approved by Owner's Representative.
- b. [Do not till pre-emergent herbicide into soil.]
- c. Observe manufacturer's recommended period prior to working and seeding in treated areas.

## 2.13 SEEDING NEW LAWNS

- A. Notify Owner's Representative for approval of seed bed prior to seeding.
- B. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.
- C. Apply Starter Fertilizer at a rate of 1 pound of actual Nitrogen per 1,000 square feet immediately prior to sowing seed. Do not sow seed and fertilizer simultaneously.
  1. Include Starter Fertilizer in hydroslurry mix.
- D. Sow seed using a slice seeding machine that places seed into soil. Do not seed when wind velocity exceeds 5 miles per hour. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
  1. For small areas where seeding machine is not feasible, use seed broadcaster and hand rake seed into soil.
  2. For slope areas greater than 3 to 1 gradient of slope, use hydroseeding application.
- E. Sports Fields: sow seed mixture at 10 lbs. per 1,000 Square feet; water thoroughly.
  1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
- F. Reseeding: Reseed areas failing to show uniform stands of grass at 10-day intervals until a satisfactory stand is achieved.

## 2.14 LAWN RENOVATION

- A. Renovate existing lawn.
- B. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
  1. Reestablish lawn where settlement or washouts occur or where minor regrading is required.
  2. Prepare planting soil as specified in Division 32 Section "Soil Preparation."
- C. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new planting soil.
- D. Mow, dethatch, core aerate, and rake existing lawn.

- E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and lawn, and legally dispose of them off Owner's property.
- G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.
- H. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 6 inches of existing soil. Provide new planting soil to fill low spots and meet finish grades.
- I. Apply seed and protect with mulch as required for new lawns.
- J. Water newly planted areas and keep moist until new lawn is established.

## 2.15 LAWN MAINTENANCE

- A. Maintain and establish lawn by watering, fertilizing, weeding, mowing, edging, trimming, replanting and other operations necessary to establish a Satisfactory Lawn.
- B. The maintenance of all lawns and grasses shall be for a period of 60 calendar days minimum after written Notice of Substantial Completion or until Final Acceptance, whichever is later. Maintenance of seeded lawns and grasses shall commence after observation and approval of the seed bed by the Owner's Representative.
- C. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.
  - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
  - 2. Protect lawns and grasses from damage including vandalism and adverse weather conditions.
- D. Weed Eradication: Remove germinated lawn seed in planting areas without harming other plant material. Spray under and 6 inches outside of fences with "Roundup" to kill all grasses and weeds.
- E. If lawns have not achieved a Satisfactory Lawn condition before the dormant period, maintenance shall recommence after the dormant period for a minimum of 60 calendar days and continue until achieving Satisfactory Lawn status. The dormant period is November 15th to March 1st.
- F. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 4 inches.
  - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.

2. Water lawn with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
- G. Mowing: Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. All grass clippings shall be collected and disposed of off-site in a legal manner. Schedule initial and subsequent mowings to maintain the following grass height:
1. Sports Lawn: Once growth has reached 4 inches, mow and cut no more than 1/3 total height of grass. Mow weekly thereafter to maintain a height of 2 inches. Maintain until Final Acceptance.
- H. Lawn Post-Fertilization: Apply fertilizer after initial mowing and when grass is dry.
1. Fertilize lawns at end of 30 days with Maintenance Fertilizer at the rate of 1 pound per 1,000 square feet.
  2. Continue fertilizing lawns at 30 days intervals with Maintenance Fertilizer at the rate of 1 pound per 1,000 square feet until the end of the Maintenance Period.

## 2.16 SATISFACTORY LAWNS

- A. Lawn installations shall have achieved the following Satisfactory Lawn criteria for Final Acceptance; as determined by the Owner's Representative.
1. Satisfactory Seeded Lawn: A healthy, uniform, even colored, dense stand of grass has been established, free of weeds and surface irregularities, humps and depressions, with coverage exceeding 95 percent over any 10 sq. ft. and bare spots not exceeding 2 by 2 inches.
- B. Areas of work which do not meet the criteria for Satisfactory Lawns shall be replaced using the specified materials and methods to re-establish lawn. Maintenance shall continue until a Satisfactory Lawn has been achieved.
- C. Seeded lawns shall have achieved Satisfactory Lawn status prior to November 15th. Seeded lawns which are not satisfactorily established at this time; as determined by the Owner's Representative, shall be sodded at no additional cost to the Owner.

## 2.17 LAWNS AND GRASSES WARRANTY

- A. Guarantee all seeded lawns and grasses in writing for a period of 1 year after Final Acceptance, or till the end of one full growing season after date of Final Acceptance, whichever is longer.
- B. During and at the end of the warranty period, remove and replace lawns and grasses which are dead, in unhealthy condition or exhibit low germination and growth rates. Provide new lawns and grasses which comply with the Drawings and Specifications, at no additional

cost to the Owner. Guarantee replacement lawns and grasses for 1 year from the date of the work.

- C. All replacement work shall be executed by the Contractor within 14 days of receiving notification from the Owner's Representative, weather permitting. If repairs are not executed within 14 days, the Owner without further notice may provide materials and labor to perform such repairs at the expense of the Contractor.

## 2.18 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris, created by lawn work, from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from foot and vehicular traffic and to protect against trespassing and damage. Maintain fencing and barricades throughout initial maintenance period and remove after lawn is established.
- C. Remove non-degradable erosion-control measures after grass establishment period.

END OF SECTION 32 9200

## SECTION 32 9500 - ESTABLISHMENT MAINTENANCE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work of this section includes all labor, materials, equipment and operations to maintain all installed work as specified herein and as noted on the Drawings.
  - 1. Maintenance of all installed work for 1 year [**Insert Period Here**] from the date of Substantial Completion.
- B. Related Sections:
  - 1. Division 32 Section "Soil Preparation" for preparation of planting soils.
  - 2. Division 01 Section "Temporary Tree and Plant Protection" for pruning of plants and trees.
  - 3. Division 32 Section "Lawn and Grasses" for lawn and meadow planting.
  - 4. Division 32 Section "Plants" for trees, shrubs and ground cover plantings.
  - 5. Division 32 Section "Plants" for mulches and tree stabilization.
  - 6. Division 32 Section "Planting Irrigation" for irrigation systems.

#### 1.2 OWNER'S RESPONSIBILITY

- A. Water: Owner will pay for water used for irrigation after the date of Substantial Completion.
- B. Power: Owner will pay for power used by irrigation controllers after the date of Substantial Completion.

#### 1.3 SUBMITTALS

- A. Submit product Data and certificates showing compliance with EPA where applicable for the following:
  - 1. Fertilizers, including application rates.
  - 2. Herbicides, including application rates
  - 3. Pesticides, including application rates.
- B. Submit a Maintenance Schedule indicating frequency and type of maintenance work to be performed at each visit for the duration of the Maintenance Contract complying with the requirements of this Section.
- C. Submit a Weed and Pest Control Plan for approval at least 30 days prior to Substantial Completion of the Work.
- D. Submit a copy of the maintenance log at two-week intervals for the duration of the Project.



#### 1.4 MAINTENANCE AND WARRANTY PERIOD REQUIREMENTS

- A. All plant materials shall be maintained in a healthy condition until the end of the Maintenance and Warranty Periods. Replace dead and unhealthy plants immediately.
- B. All plant materials and equipment replaced under warranty shall be replaced in accordance with all provisions of the Contract Documents. Equipment shall be of the same manufacturer, model, size and quantity as originally installed. Plant material shall be of the same variety, size, and quantity as originally installed.
  - 1. Owner reserves the right to inspect plant materials replaced under warranty and reject those which do not conform to specified standards.
- C. Schedule included in this Section indicates task minimums. Contractor may perform tasks at greater frequency to comply with Contract requirements.

#### 1.5 WEED and PEST CONTROL PLAN

- A. Contractor shall submit a Weed and Pest Control Plan for approval at least 30 days prior to Substantial Completion of the work.
  - 1. The Weed and Pest Control Plan shall define all scheduled applications of herbicides and pesticides as required herein. It shall identify the applicator and license number, the names of the herbicide and pesticide products, along with the location, rate, frequency, season and method of application.
  - 2. The Contractor may submit for pre-approval the use of herbicides and pesticides to be applied on an as needed basis in anticipation of probable weed growth or infestations.
  - 3. No herbicides or pesticides shall be applied until Weed and Pest Control Plan is approved and all applications shall be in accordance with the plan.
  - 4. If unanticipated weed growth or infestations occur, the Contractor shall be required to modify Weed and Pest Control Plan and secure written approval of Owner and Owner's Representative prior to application.
  - 5. The Owner and Owner's Representative shall review and approve the plan.
- B. All applications of herbicides and pesticides shall be performed by **an Oregon** State licensed commercial applicator. All precautions shall be taken in the handling and applications of all herbicides and pesticides as stated on the product label and in the Pacific Northwest Weed Control Handbook, latest edition. No contamination of vicinity water systems or storm drain systems allowed. No cleaning of equipment or disposal of products allowed in project vicinity.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. All products shall be as specified in the appropriate Specification Sections.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Inspection: All grounds will be inspected weekly throughout the maintenance period for weeds, pests, plant health, erosion, paper and debris.
- B. Pest and Disease Control:
  - 1. Inspect all plants for signs of pest or disease once per week during the growing season and report any such conditions in the monthly report.
  - 2. Begin treatment for pests or diseases immediately following observation.
  - 3. Pest and disease control shall be carried out by skilled operators, using methods approved under current laws and regulations.
  - 4. Use the recommended type of equipment and method of application for each chemical as recommended by the chemical manufacturer.
  - 5. All chemicals shall be mixed and applied as stated on the label of the manufacturer.
  - 6. Be extremely cautious in the mixing, handling and application of all chemicals as they may be harmful (if misused) to humans, plants, and animals.
  - 7. The Contractor shall be liable for any damage caused through the misuse of any plant disease or plant insect control method.
  - 8. Rodent Control: The Contractor shall take the necessary action to prevent damage by rodents and moles. Such damage that does occur shall be repaired by the Contractor.
- C. Watering:
  - 1. An irrigation system will be installed on this Project. The Contractor shall ensure that the irrigation system is in an operating condition throughout the period of this Contract.
  - 2. Coordinate and manage the irrigation controller so that appropriate amounts of water are applied based on season, weather condition and plant material.

### 3.2 LAWN AREA OPERATIONS

- A. Fine Mowing:
  - 1. For all Lawn areas the Contractor shall inspect and police the grounds for litter and debris prior to each mowing, and dispose of it.
  - 2. All Lawn is to be mowed every 7 days beginning in April and through the end of September, with an additional two mowing in October, November, December, February and March as needed.
  - 3. Mowing height for all irrigated lawn areas shall be no less than 1-1/2 inches, not to exceed 2-1/2 inches between mowing operations.
  - 4. Mowing height for non-irrigated lawn areas shall be not less than 3 inches, not to exceed 6 inches between mowing operations.
  - 5. The lawn shall be cut at a uniform height, with reel mowers in open areas and rotaries in closed areas. Scalping and uneven cutting shall be prevented. Any

- excess clippings shall be dispersed and/or collected to prevent damage to existing lawn areas or if it causes an unsightly appearance.
6. Mower blades shall be maintained in a good condition for an even cut. Mower blades shall be cleaned prior to entering site to prevent dispersal of weed seeds picked up from off site.
  7. Contractor shall repair or replace all trees, shrubs and other plantings and other permanent fixtures that are damaged during mowing operations. Mowing equipment will be adjusted and maintained to provide the best possible cut.
- B. Edging: All sidewalks, curb lines, concrete slabs, bed edges shall be edged as needed to maintain a neat, clean appearance, once every three mowings (minimum).
- C. Hand Trimming: Trimming shall be performed around all road signs, guard posts, trees, shrubs, utility poles and other obstacles. The grass to be trimmed shall be trimmed no less than the desired height of cut determined by the mowing operation. Trimming is to be done with each mowing operation.
- D. Lawn Fertilization:
1. Fertilizing and Liming: Perform as recommended in the soil analysis reports submitted under Division 32 Section "Soil Preparation," and as necessary to maintain cover crop in a healthy growing condition.
  2. Application of fertilizers carried out by the Contractor to maintain proper nutrient levels and provide a consistent dark green lush appearance throughout the maintenance period. Lawn shall be fertilized a minimum of 1 time per maintenance period applying 8 pounds of nitrogen per 1,000 square feet, to maintain a consistent, lush green appearance.
  3. Deficiencies of sulfur or magnesium or other nutrients as determined by soil analysis shall be corrected as needed. Timing of these applications may vary according to the need for response.
- E. Weed Control:
1. Inspect Lawn areas for weed growth twice per month during the growing season and remove all weeds within one week of observing weed growth.
  2. Maintain all areas in a weed free condition.
  3. The application of herbicides on all mowed lawn areas shall be done according to the approved Pest and Weed Control Plan. One application with follow-up applications as required to maintain a kill of 90 percent of broadleaf weeds shall be required.
  4. Pre-emergent herbicides to be used to control specific annual grasses, such as annual bluegrass and crab grass.
  5. Weed control procedures shall have no detrimental effect on the growth of desired plants.
- F. Re-Seeding: Upon detection of damaged or failing areas and areas showing unsatisfactory growth and coverage, the restore the area as necessary to establish a complete cover crop. Reseed using the seed mixes specified.
- G. Clean Walks: At the conclusion of each visit, walks adjacent to work areas are to be cleaned.

H. Leaf Removal:

1. Removal of all leaves from all lawns, planter beds and walkways and their disposal offsite shall be completed throughout the maintenance period as needed to maintain a clean appearance throughout the Project.
2. Main entries, high traffic areas, and walkways shall be cleaned weekly. All other landscape areas are to have complete leaf removal monthly, during October, November and December.

I. Aeration of Lawn Areas: Aeration is an extra service, to be performed as needed with Owner's authorization.

3.3 ORNAMENTAL PLANTING AREAS

A. Fertilizing:

1. Fertilizing and Liming: Perform as recommended in the Soil Analysis reports and recommendations, and as necessary to maintain cover crop in a healthy growing condition. See Division 32 Section "Soil Preparation."
2. Fertilizing of all trees, shrubs and ground cover is to be done once at the end of the maintenance period. Work the fertilizer thoroughly into the top 2 inches of soil.
3. In March, within the first growing season, fertilize all planting areas with one (1) application of each of the following fertilizers, all at the rate of 7 pounds per 1000 square feet of soil surface:
  - a. Nitroform slow release (38-0-0)
  - b. Treble superphosphate (0-45-0)
  - c. Sulphate of potash (0-0-50)

B. Weed Control:

1. All planter beds, tree circles, sidewalk cracks, and pavers, are to be sprayed once per month to control unwanted grasses and broadleaf weeds according to approved Pest Control Plan. Chemical practices shall not be a substitute for hand-weeding where the latter is required for complete removal.
2. All planter beds are to have one application of pre-emergence herbicide at the end of the maintenance period. Pre-emergence herbicides shall be of the non-leaching type, with minimal soil contaminating levels. Pre-emergence herbicides shall not be used in groundcover areas unless approved by the Owner's Representative.

C. Pruning: done to enhance natural growth. The Contractor shall remove dead, damaged and diseased portions of the plant. Do not remove collar at the branch base when pruning. All major pruning shall be done following flowering or during plant's dormant season. Emergency or minor pruning shall be done when needed. Pruning of trees shall be performed by a certified arborist.

1. Shearing of plantings will be permitted only where directed by the Owner's Representative.
2. Provide remedial attention and repair to shrubs and trees as appropriate by season or in response to incidental damage.

3. Prune shrubbery to maintain proper size in relationship to adjacent planting and intended function.
4. Prune trees as required to remove weak branching patterns and maintain balance of head growth development. Remove lower limbs when obstructing vehicular or pedestrian clearances.
5. Prune groundcover plantings as required to restrain perimeter growth to within planting areas where adjacent to walks and curbs. Tip prune selected branchlets of low growing shrub or groundcover masses to maintain even overall heights and promote fullness.
6. Spent blooms shall be removed from all flowering shrubs to promote better growth habit and flower production.
7. Remove blades of ornamental grasses that lay over flat to the ground. Retain grasses that are able to support their own weight. In the early spring, tie-off ornamental grasses with jute twine or a grass blade at the base of the plant and cut evenly across 6 inches from the base of the plant.

D. Raking: All planter beds will be raked through once per month to remove debris and promote an attractive fresh appearance.

E. Mulching: Maintain a 2 inch depth of specified mulch over all shrub planting areas unless directed otherwise by the Owner's Representative. Do not mulch groundcover areas.

F. Tree Stakes:

1. Check ties every 4 months to ensure that they are not causing a depression in the bark. Loosen, repair or replace as required.
2. Retain guy wires in good repair until the tree is strong enough to withstand strong winds. Check at end of maintenance period. Ensure that they do not cause a depression in the bark. Repair or replace as required.

G. Cultivating:

1. In the spring, before beginning watering, cultivate the soil surface shallowly as necessary to ensure penetration of water and air into the soil. Repeat as necessary for weed control and soil permeability.
2. Avoid cultivating into the root zone of plants, particularly shallow-rooted groundcovers

### 3.4 NATIVE PLANTING AREAS

A. The level and style of maintenance shall reflect the native landscape character of these portions of the site.

B. Weed Control:

1. The Contractor shall remove only noxious weeds and non-native volunteer species. Inspect for weed growth once per month. Remove all weeds within two weeks of inspection.
2. Native species that naturalize in native planting areas shall not be removed. The growth of such plants shall be encouraged by maintenance procedures.

3. The type of weeds in an area shall determine the method of treatment. Weed control may consist of, but is not limited to, the following:
    - a. Hand-pulling, digging, cultivation.
    - b. Encouraging the growth of desired plants which can compete with weeds.
    - c. Timing the mowing of grass areas to correspond with the seeding cycle of weeds.
    - d. Use of approved contact herbicide, applied only by licensed applicator.
- C. Fertilizing:
1. Fertilizing and Liming: Perform as recommended in the soil analysis reports and as necessary to maintain cover crop in a healthy growing condition. See Division 32 Section "Soil Preparation."
  2. Fertilizing of all trees, shrubs and ground cover is to be done once at the end of the maintenance period. Work the fertilizer thoroughly into the top 2 inches of soil.
  3. In March, within the first growing season, fertilize all planting areas with 1 application of each of the following fertilizers, all at the rate of 7 pounds per 1000 square feet of soil surface:
    - a. Nitroform slow release (38-0-0)
    - b. Treble superphosphate (0-45-0)
    - c. Sulphate of potash (0-0-50)
- D. Pruning: Pruning shall be done to enhance natural growth. Remove dead, damaged and diseased portions of the plant. Do not remove collar at the branch base when pruning. All major pruning shall be done following flowering or during plant's dormant season. Emergency or minor pruning shall be done when needed. Pruning of trees shall be performed by a certified arborist.
1. Provide remedial attention and repair to shrubs and trees as appropriate by season or in response to incidental damage.
  2. If at the time of installation, native plants are not proportioned as specified, pruning operations shall be done to encourage the growth of full, well-proportioned plants. Such pruning will likely include but not be limited to removal of long, "leggy" branches and shearing plants back to encourage the growth of more branches. The Contractor shall ask for direction from the Owner's Representative before beginning this Work.
- E. Seeded Areas:
1. The Contractor shall be responsible for protecting seeded areas from damage and maintaining seeded areas as necessary to establish a complete coverage of the specified vegetation in a healthy and growing condition for 365 days from the date of substantial completion of the project.
  2. Mowing: Mow all seeded areas as required to maintain in a healthy growing condition, and to control the germination and spread of noxious weeds. Mow a minimum of once per maintenance period. Line trimmers may be used where appropriate.

3. Re-Seeding: Upon detection of damaged or failing areas and areas showing unsatisfactory growth and coverage, the Contractor shall restore the area as necessary to establish a complete cover crop. Reseed using the seed mixes specified.

F. Do not mulch native planting areas.

G. Rodent Control: The Contractor shall take the necessary action to prevent damage to all plants by rodents and moles. Such damage that does occur shall be repaired by the Contractor. The Contractor may install wire mesh or plastic guards around the base of plants.

### 3.5 IRRIGATION EQUIPMENT WARRANTY WORK AND OPERATION

A. Establish time settings and intervals of irrigation water application for each valve of all irrigation zones. Make changes when necessary to correspond to variable watering requirements for all planting areas.

B. Observe operation of all irrigation heads at least twice each operating month. Check for coverage and plugged or broken heads and leaks; repair leaks, balance system and clean or replace heads or nozzles as required to maintain system in proper working order. Replacement heads shall be as originally specified in the Drawings and Specifications.

C. Perform necessary site visits and observations to maintain the proper amounts of moisture in soils to promote healthy and vigorous plant growth. Correct conditions of over or under-watering as may be determined by weekly observations during the irrigation season.

D. System Winterization: Shut off and completely drain systems no later than November 1. Turn off all main supply valves; open all manual drain valves; air drain, and bleed valves on backflow prevention devices. Perform winterization prior to the specified dates in the event of earlier freezing weather.

E. System Spring Start-up: Activate irrigation systems in late March. Contractor shall be responsible for repairing damage caused by freezing at no additional cost to Owner. Operate and observe all portions of the system and perform necessary rebalancing, flushing, cleaning or other work required to re-establish proper irrigation functions.

1. Test and certify backflow preventers prior to placing the irrigation system back in service.

- a. Original copies of the certification shall be submitted to the Owner.

- b. Backflow preventers shall be labeled with plastic laminated field history tag showing date and tester information.

2. Flush drip valve filters and backflow preventer "Y"-strainers.

F. Repair and/or replacement for any work damaged or otherwise affected even by causes beyond Contractor's control shall be the responsibility of the Contractor.

G. Repair trench backfill which settles more than 1 inch during the Irrigation Warranty period. Warranty to include repair of planting areas, lawns, paving and walks damaged by settlement.

END OF SECTION 32 9500